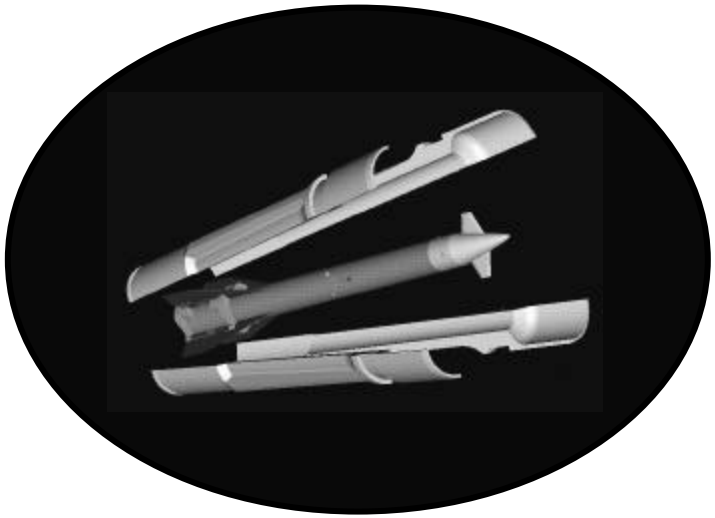
The Cased Telescoped Guided Projectile



By David Leishman

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The Problem With Conventional Ammo

- Increased stand off Ranges (2 to 4km)
  - Conventional ‘Dumb’ bullets P(hit) decreases rapidly as range increases.
  - The engagement time increases and fire control predictions are less accurate.

How Can we Improve This?

- Three Main Factors can Improve the Chance of Success
  - Increase Size of Target Area
  - Improve Accuracy of Target Path Prediction
  - Make P(h) Independant of Range to Target

Solution

We will focus on making P(h) Independant of Range

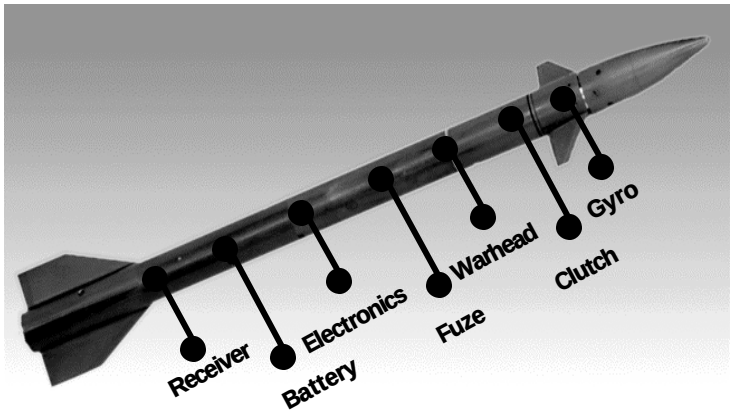
-Combining both Starstreak technology with the Cased Telescoped Weapon System.

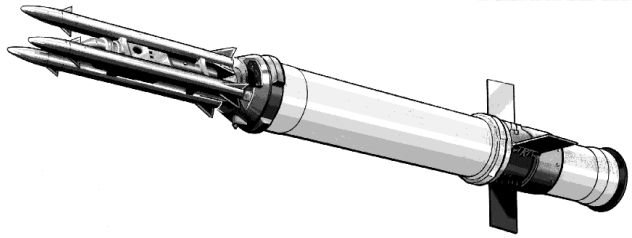
- Fired from Light Armored Vehicles fitted with CTWS.

- Increasing efficiency of weapon load reducing logistic load. Easy to handle and store.

Short Range Air Defence Missile System
Man portable or Vehicle mounted

THALES





STARSTREAK

- Peak velocity Mach 3.35
- 3 Laser guided darts
- Immune to countermeasures
- Inservice with British Army

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CTGP - The Concept

- Guided dart Projectile adapted from CT Munition
- Uses Starstreak guidance and flight control technology
- Projectile optimised for aerodynamic requirements

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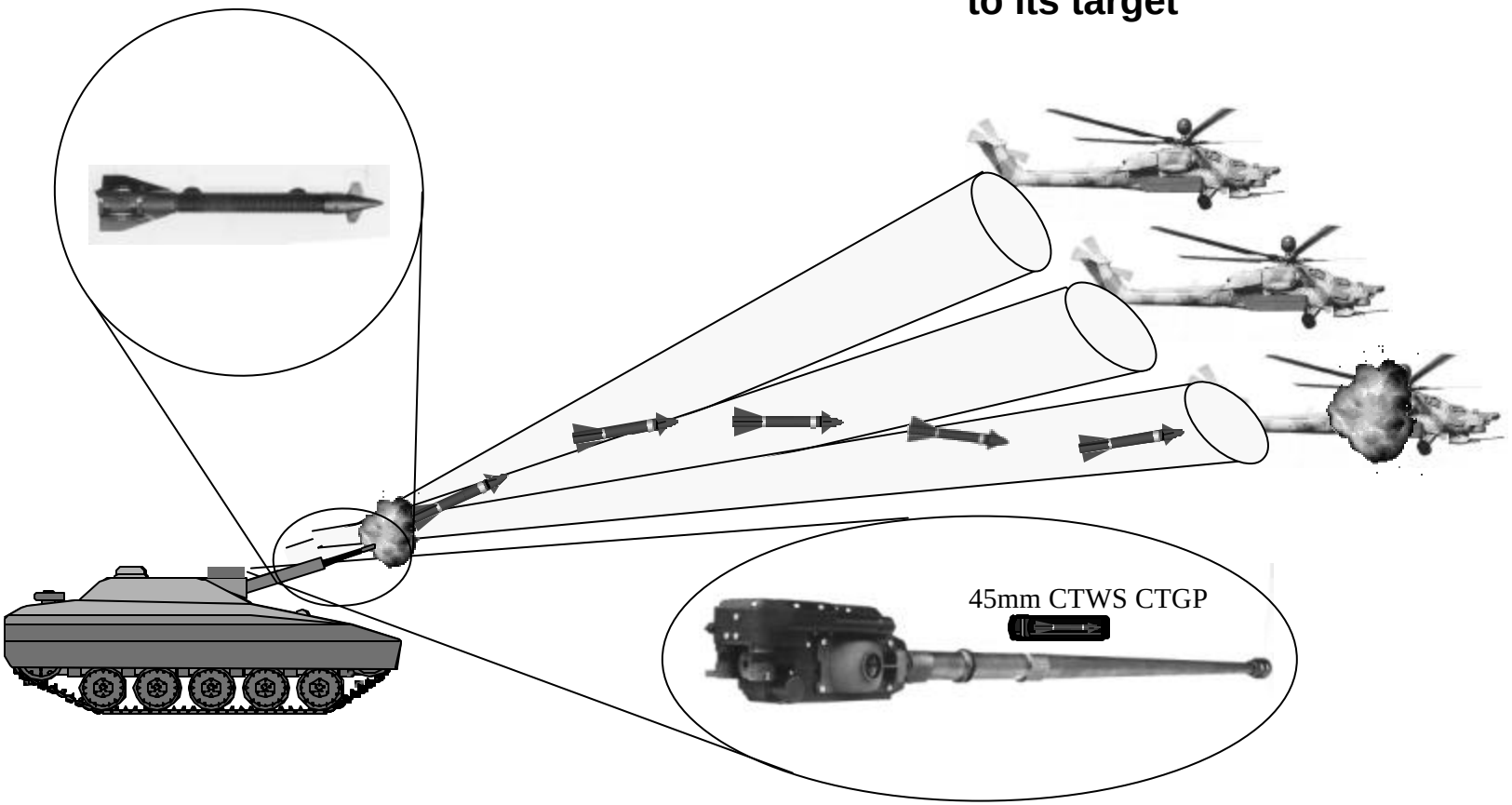
CTGP CONCEPT

Laser guides projectile to its target



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The Threat

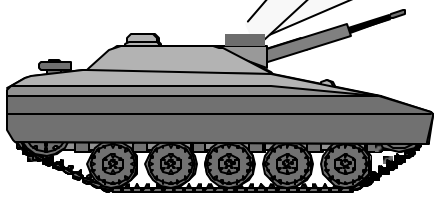
Attack Helicopters

Fixed Wing Aircraft

UAVs

Cruise Missiles

ATGWs



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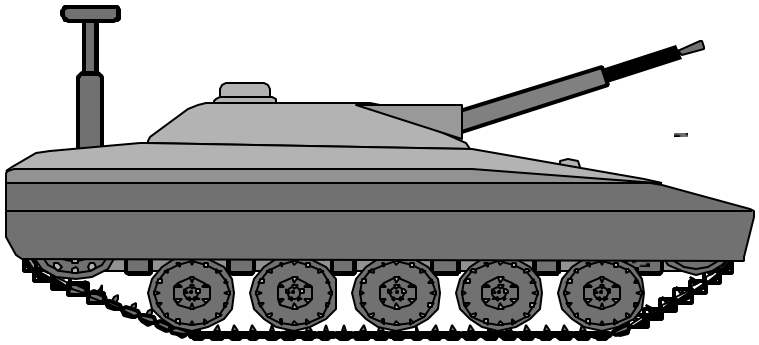
The Cased Telescoped Weapon System

Rate of fire 200 shots per minute

CTWS Selected for both SIKA & Lancer Demonstrators on the TRACER/SCOUT Programme



CT cartridge allows simplified feeder system & general storage

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Areas of Technical Difficulty

Fitting the CTGP into the space available in a current 40mm CTWS.

- Need to Fold fins
- Must Achieve Stable Launch Conditions
- Protect components from heat & Gases

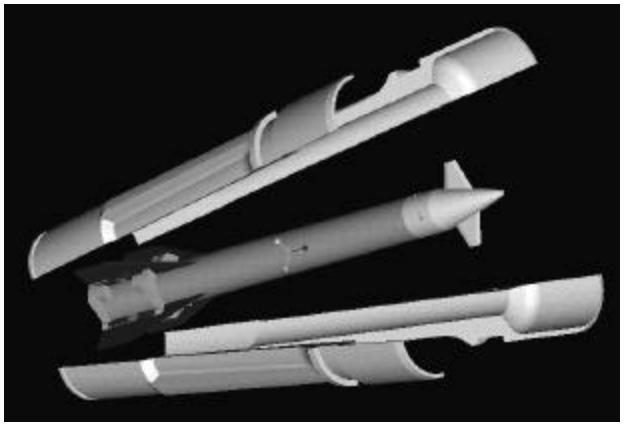
Moving from Missile to Gun Launch

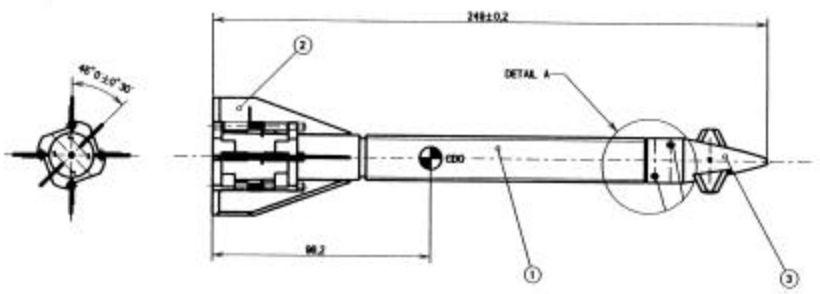
- Strength of design - Must withstand about 30,000 g on initial firing
- Certain Components are not Transferable

Projectile Design

Iteration 1 design:

- 4 rear fins deploy upon sabot release
- 2 canards ready deployed in sabot
- Extended sabot to protect components





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Studies Completed

- **Study 1 - April 1999**
  - CTGP as a solution to an advanced aircraft cannon requirement
- **Study 2 - September 1999**
  - CTGP proposed as solution for US Enhanced Accuracy Medium Calibre Weapon System for Future Combat Vehicle (FCV)
- **Study 3 - October 2000**
  - Folded fin prototype, first gun launch, discarding sabot

Study 1 - Conclusions

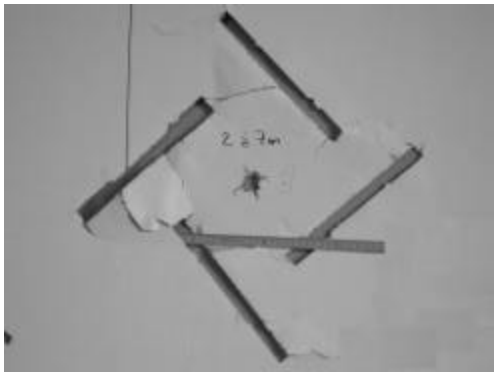
From the initial study:

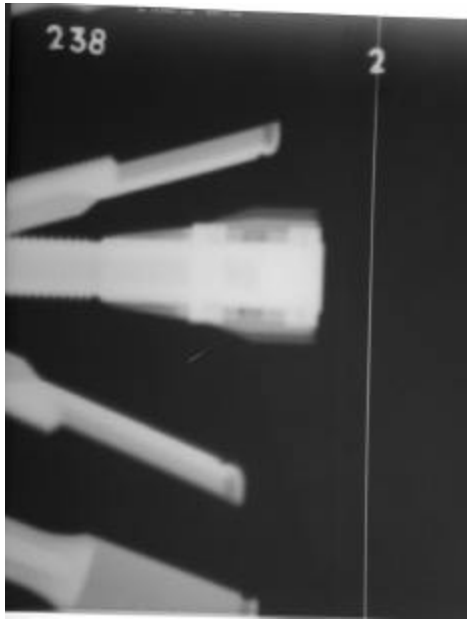
- **The CTGP concept is Operationally Viable**
- **The Maturity of both Starstreak & CTWS Systems reduces development Risk**
- **Offers a step change in mission effectiveness**
  - Improved hit probability
  - Increased Window Of Opportunity
  - Reduced pilot workload
- **Risks identified:**
  - Fin Deployment
  - Launch survivability
  - System Integration

Study 2 - Conclusions

- **The CTGP would produce a step change in effectiveness for a Land-based System**
- **CTGP would provide various roles:**
  - Offensive Weapon System
  - Self Defence
  - Force Protection
- **Effective target set:**
  - UAV, UCAV
  - Fixed Wing Aircraft
  - Attack Helicopter
  - Cruise Missiles
  - ATGM
  - Artillery Rockets

Study 3





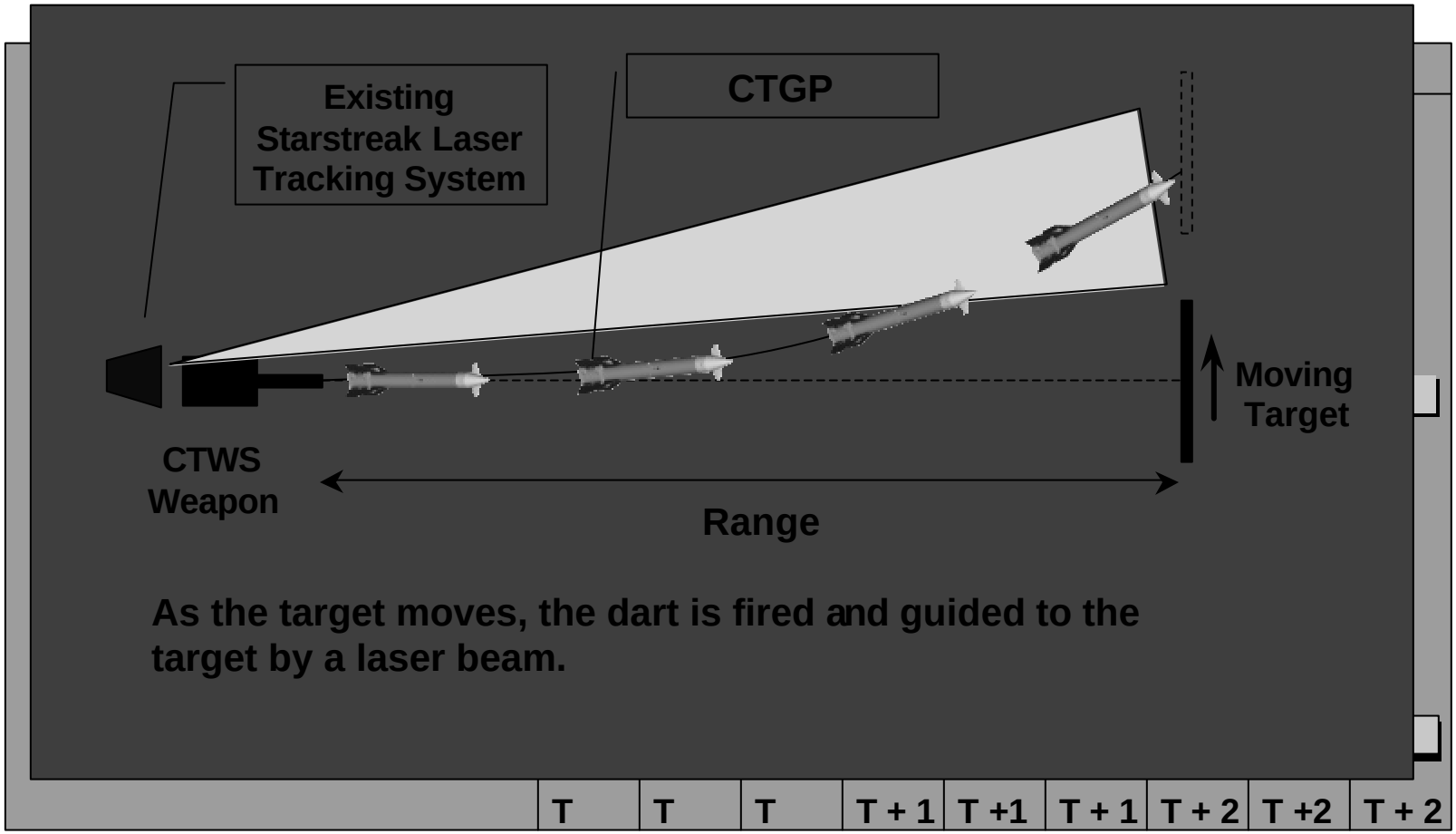
Trial verified that:

- The projectile could be fired from the CTWS
- The sabot discards correctly
- Fins would deploy on exiting the barrel
- Stable launch of projectile is achieved

Feasibility Studies - Conclusions

- **CTGP launched from the CTWS is technically feasible**
  - Firing from CTWS, Fins deploying, stable launch demonstrated
- **Offers a step change in mission effectiveness**
  - Improved hit probability
  - Improved stowed kill ratio
- **Areas of greatest risk identified:**
  - Gun Launch Survivability of Guidance Electronics
  - Systems Integration (Fire Control System, Sensors)

Next Step



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Future Developments

- **Continued Risk Reduction**
  - Optimise projectile design
  - Produceability (Manufacturing cost)

- **Technical Demonstrator Programme**
  - Develop solid state guidance (select polarised laser field or Radar Information Field)
  - Platform Fire Control System / Sensor integration

- **Operational Effectiveness Studies**
  - Air, Land, Sea Applications,

End of Presentation

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